NOAA Research in Massachusetts

MA-1 through 10 (Statewide)

Climate and Global Change Program

NOAA is responsible for providing climate information to the nation in order to prepare and protect climate sensitive sectors of society and the economy. To carry out this mission, NOAA's Climate and Global Change Program conducts focused scientific research to understand and predict variations of climate. The Program is comprised of a number of research elements, each focusing on a specific aspect of climate variability. Taken together, this research contributes to improved predictions and assessments of the effects of climate variability and change on different environments over a continuum of time scales from season to season, year to year, and over the course of a decade and beyond. This research is accomplished through the strong support of the academic and private sectors, as well as NOAA and other federal laboratories. In FY 2001, NOAA's Climate and Global Change Program provided approximately $3,543,524 in support of climate research in the State of Massachusetts. For more information please visit http://www.ogp.noaa.gov

MA-3, 4, 6 through 10 (Based in Cambridge - serves Massachusetts coastal zone)

National Sea Grant College Program
Massachusetts Institute of Technology Sea Grant College Program

Massachusetts is served by two Sea Grant Programs, both of which are part of NOAA's National Sea Grant College Program and together make up a statewide network of research, education, and extension services that promote the sustainable use of marine and coastal resources. One of the two programs is the Massachusetts Institute of Technology (MIT) Sea Grant College Program. On-going research in this Program is focused on providing advanced marine instrumentation and delivery systems for a more exact understanding of ocean processes, and enabling safe and profitable accommodation with this imperiled resource. The program continues to be a leader in advanced technology, remains committed to cultivating stronger relationships between science, commerce and the public at large, and encourages the intelligent use of marine natural resources. MIT's recent research efforts in marine natural resources include a process based on the solubility of fish muscle proteins and research to examine the feasibility of developing an artificial version of fish skin using tissue engineering techniques. Other recently completed research included studies of novel delivery systems for the vaccination of farmed fish; novel and potentially important research in seaweed as a source of compounds having commercial potential in food processing and pharmaceuticals; and research on environmentally acceptable methods of antifouling based on the activity of metabolites from marine microorganisms. In the area of fisheries and aquaculture a number of projects currently active or recently completed have resulted in considerable success. A sea scallop mariculture program has been established to develop, refine and foster the commercialization of several innovative technologies needed by the Northeast sea scallop industry for its conversion to a sustainable, more economically viable industry. A collaborative effort recently completed established

the commercial trade-offs and viability for offshore mussel aquaculture. The MIT program also has continuing research and advisory efforts in coastal management and its utilization. Current and recently completed projects provided partial support for faculty, staff and students at the University of Massachusetts (Amherst, Boston, and Lowell campuses) Boston University, Harvard University, Northeastern University, Massachusetts Maritime Academy, Woods Hole Oceanographic Institution, the New England Aquarium, and the Universities of Rhode Island and Maryland. In addition the Program currently provides support to Cohasset Public High School and recently provided support to the public schools in Quincy. In FY 2001, the MIT Sea Grant projects received $2.3 million from the National Sea Grant College Program. For more information please visit http://web.mit.edu/seagrant/

MA-3, 4, 6 through 10 (Based in Woods Hole - serves Massachusetts coastal zone)

National Sea Grant College Program
Woods Hole Oceanographic Institution Sea Grant Program

Massachusetts is served by two Sea Grant Programs, both of which are part of NOAA's National Sea Grant College Program and together make up a statewide network of research, education, and extension services that promote the sustainable use of marine and coastal resources. One of the two programs is the Woods Hole Oceanographic Institution (WHOI) Sea Grant Program. Current research projects in this Program include studies of biochemical toxicology in marine mammals and aquatic birds; determining the reproductive success of commercially valuable squid in New England with DNA fingerprinting; understanding bivalve larval dispersal by looking at trace elements present in their shells; conducting a demographic analysis of the endangered North Atlantic right whale; and assessing the impact of Boston's new sewage outfall on toxic *Alexandrium* populations and the recycling of anthropogenic metals in Massachusetts Bay sediments. Citizens, industry, and policy-makers are kept informed on topics such as sustainable management of the region's coastal landforms: beaches, bluffs, dunes, barrier beaches, coastal banks, and salt marshes; and the latest development in shellfish aquaculture techniques through WHOI Sea Grant's Extension Program, a cooperative effort between Sea Grant and Barnstable County Cooperative Extension Service. A new series of fact sheets designed for legislators and coastal decision-makers, *Focal Points*, covers topics of current interest in the region, and another fact sheet series, *Marine Extension Bulletins*, provides information of a more technical nature, to industry colleagues. Recent educational efforts include updating the successful national Sea Grant publication *Marine Science Careers: A Sea Grant Guide to Ocean Opportunities*, and debut of the marine science careers website, www.marinecareers.net. Together with MIT Sea Grant, WHOI Sea Grant publishes the newsletter *Two if by Sea*, highlighting research and educational accomplishments taking place throughout Massachusetts and the northeast region. The program also updates on an annual basis a directory of local private and public organizations that regularly deal with issues pertaining to coastal and marine management. Massachusetts universities and institutions that have been funded by WHOI Sea Grant include Boston University, the University of Massachusetts (Amherst, Boston, and Dartmouth campuses), Harvard University, Wheaton College, Salem State College, Woods Hole Oceanographic Institution, Marine Biological Laboratory, Woods Hole Research Center, Northeast Massachusetts Aquaculture Center, Southeast Massachusetts Aquaculture Center, Cape Cod Museum of Natural History, Martha's Vineyard Shellfish Group, private individuals, and numerous federal, state, and local agencies and partners. In FY 2001, WHOI Sea Grant projects received $1.15 million. For more information please visit http://www.whoi.edu/seagrant/

MA-3, 4, and 6 through10 (coastal waters)

National Undersea Research Program
National Undersea Research Center for the Northeastern United States and Great Lakes

The National Undersea Research Center for the Northeastern United States and Great Lakes is located at the University of Connecticut, Avery Point in Groton, Connecticut. It is one of six regional centers supported by the National Undersea Research Program. The Center supports and conducts undersea research in the waters off the northeast coast of the United States and in the Great Lakes. The center provides science and operational support (occupied submersibles, remotely operated vehicles and mixed gas diving technologies) and funding for reviewed projects within this region. The Center supports research on the physical, chemical, and biological factors controlling the cycling and fates of organic contaminants and heavy metals (trace metals) at the sediment/water interface and their ultimate impacts on biological productivity. Also receiving special attention are the habitat characteristics controlling the recruitment and population dynamics of recreational and commercial species of fish, including "pest" species. FY 2001 funding for the Center totaled $1.36 million. For more information please visit http://www.nurc.uconn.edu

MA-4 and 5 (Acushnet and Westford)

Forecast Systems Laboratory
GPS Meteorological Observing Systems

NOAA's Forecast Systems Laboratory (FSL) operates a rapidly expanding network of GPS Meteorological (GPS-Met) Observing Systems to monitor the total quantity of precipitable water vapor in the atmosphere. Currently, there are 93 systems over the contiguous 48 states and Alaska, and plans are being made to extend these observations to Hawaii, Puerto Rico, the Caribbean Islands, and Central America. Water vapor is an important but under-observed component of the atmosphere that plays a major role in severe weather events and the global climate system. GPS-Met systems provide accurate water vapor measurements under all weather conditions, including thick cloud cover and precipitation, and do so at very low cost. The network is being developed by FSL in cooperation with federal, state and local government agencies, universities, and the private sector. The GPS stations provide high-accuracy surveying and navigation services for National defense, automated agriculture, safe land and marine transportation, government infrastructure management, and 911 emergency response services. Fortuitously, these systems can also be used for meteorology with the addition of surface weather sensors. GPS-Met systems located in Massachusetts include a sites operated by MIT near Westford, and one operated by the U.S. Department of Transportation near Acushnet. For more information please visit http://www.gpsmet.noaa.gov/jsp/index.jsp

MA-8 (Cambridge)

Climate and Global Change Program
Research and Assessment Systems for Sustainability Program

NOAA's Climate and Global Change Program provides support for the Research and Assessment Systems for Sustainability Program headed by Harvard University. This program fosters the design and evaluation of strategies with which the next generation of national and international global

environmental change programs might more effectively integrate and support its research, assessment and decision-support activities. In particular, it catalyzes and contributes to three interrelated lines of work: (1) Broadening the global change agenda to engage more directly the agenda of the environmental goal of the last twenty years: sustainability. (2) Developing a place-based, integrated understanding of global change effects and vulnerabilities. (3) Designing, supporting and managing systems that can better integrate research, assessment and decision-support activities on problems of global change and sustainable development. For more information please visit http://sust.harvard.edu/

MA-10 (Martha's Vineyard)

Air Resources Laboratory
Coupled Boundary Layers Air-Sea Transfer

The Field Research Division of NOAA's Air Resources Laboratory used a research aircraft in the Coupled Boundary Layers Air-Sea Transfer (CBLAST) low wind pilot field study to acquire high-resolution *in situ* atmospheric turbulent fluxes in the marine atmospheric boundary layer and simultaneously documenting the characteristics of the surface wave field with various remote sensors. The CBLAST-Low pilot study was successfully conducted during a three-week period in July and August 2001 off the south shore of Martha's Vineyard. A total of twenty missions (about 48 flight hours) were flown on days with light winds under various atmospheric stabilities. Data acquired in CBLAST-Low will support the test and refinement of parameterizations used in air-sea models for light wind regimes. In addition, such measurements will provide important boundary conditions to determine boundary layer turbulence and other atmospheric processes controlling the exchange of energy across the air-sea interface. For more information please visit http://www.noaa.inel.gov

MA-10 (Woods Hole)

Cooperative Institute for Climate and Ocean Research

The Cooperative Institute for Climate and Ocean Research (CICOR), located in Woods Hole, is a collaborative effort between NOAA and the Woods Hole Oceanographic Institution. The research activities of CICOR are organized around three themes: coastal ocean and near-shore processes, the ocean's participation in climate and climate variability, and marine ecosystem processes analysis. These theme areas, each of which has significant implications for human society, are interrelated, and scientific progress requires collaboration by scientists within and between disciplines. In each case, progress depends on a combination of fundamental process studies, the development and deployment of technological systems for sustained observation, and the development of predictive models that are based on an understanding of the underlying processes and that assimilate information from observational systems. In FY 2001, CICOR was funded for approximately $4.2 million. Funded projects included the ARGO profiling float program, marine mammal research, Arctic research, Harmful Algal Bloom research, and climate research in the Tropical Atlantic and Eastern Pacific oceans. For more information please visit http://www.whoi.edu/science/cicor/

MA-10 (Woods Hole)

Climate and Global Change Program
WHOI Upper Oceans Processes Group

NOAA's Climate and Global Change Program provides support for the Upper Oceans Processes Group at Woods Hole Oceanographic Institution. The Upper Ocean Processes Group provides technical support to upper ocean and air-sea interface science programs. Deep-ocean moored surface buoy arrays are designed, fabricated, instrumented, tested, and deployed at sea for periods of up to one year. The surface buoys are equipped with meteorological sensors and recording packages with a satellite telemetry capability. Special tests of sensors and instruments to determine the effects of severe weather and motion are ongoing. The work includes data acquisition, verification, display, and archiving. Other areas of expertise include meteorological instrument calibration and operation of a wind tunnel, constant temperature baths, a controlled humidity and temperature chamber, barometric pressure standards, and radiation instruments that can be used for comparison measurements. The group is also available to design new sensors to work with the recently developed, tested and now commercially available standard IMET (Improved METeorological Measurements for Buoys and Ships) system. For more information please visit http://uop.whoi.edu

MA-10 (Woods Hole)

Ocean Exploration

In 2001, with a $4 million appropriation from Congress, NOAA launched a systematic, strategic effort through the Office of Ocean Exploration to search and investigate the oceans for the purpose of discovery. Conducted during September and October of 2001, scientists explored three regions of the Atlantic Ocean stretching from Maine to Georgia. Woods Hole Oceanographic Institute played a critical role in the exploration providing R/V Atlantis and Alvin as tools for scientists to conduct their research. For more information please visit http://www.oceanexplorer.noaa.gov

For further information about these and other NOAA programs, please contact NOAA's Office of Legislative Affairs at (202) 482-4981.

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